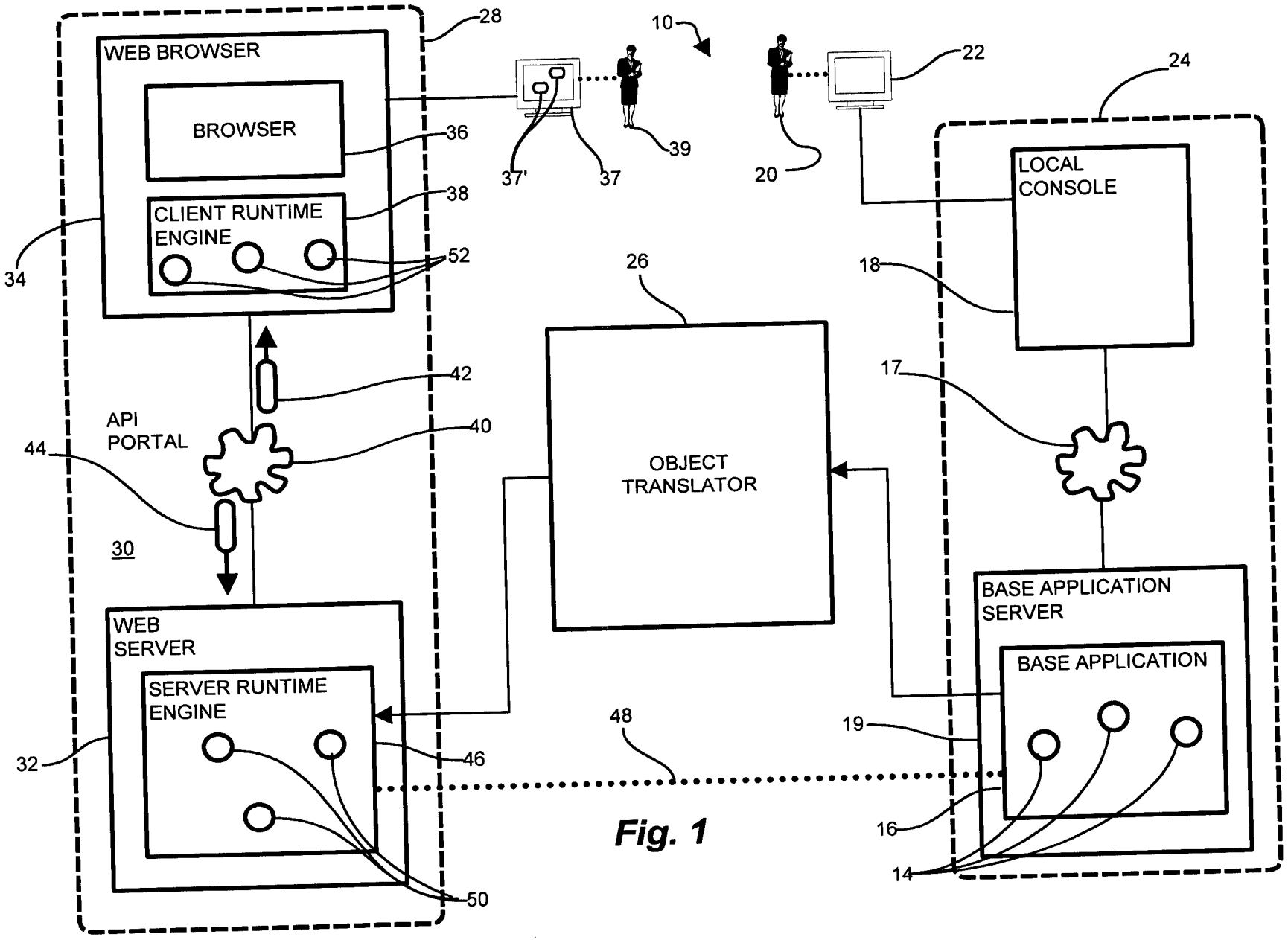
WEB BROWSER
BROWSER
CLIENT RUNTIME ENGINE
API PORTAL
WEB SERVER
SERVER RUNTIME ENGINE
OBJECT TRANSLATOR
LOCAL CONSOLE
BASE APPLICATION SERVER
BASE APPLICATION
10
14
16
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37
37'
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42
44
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48
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52

Fig. 1

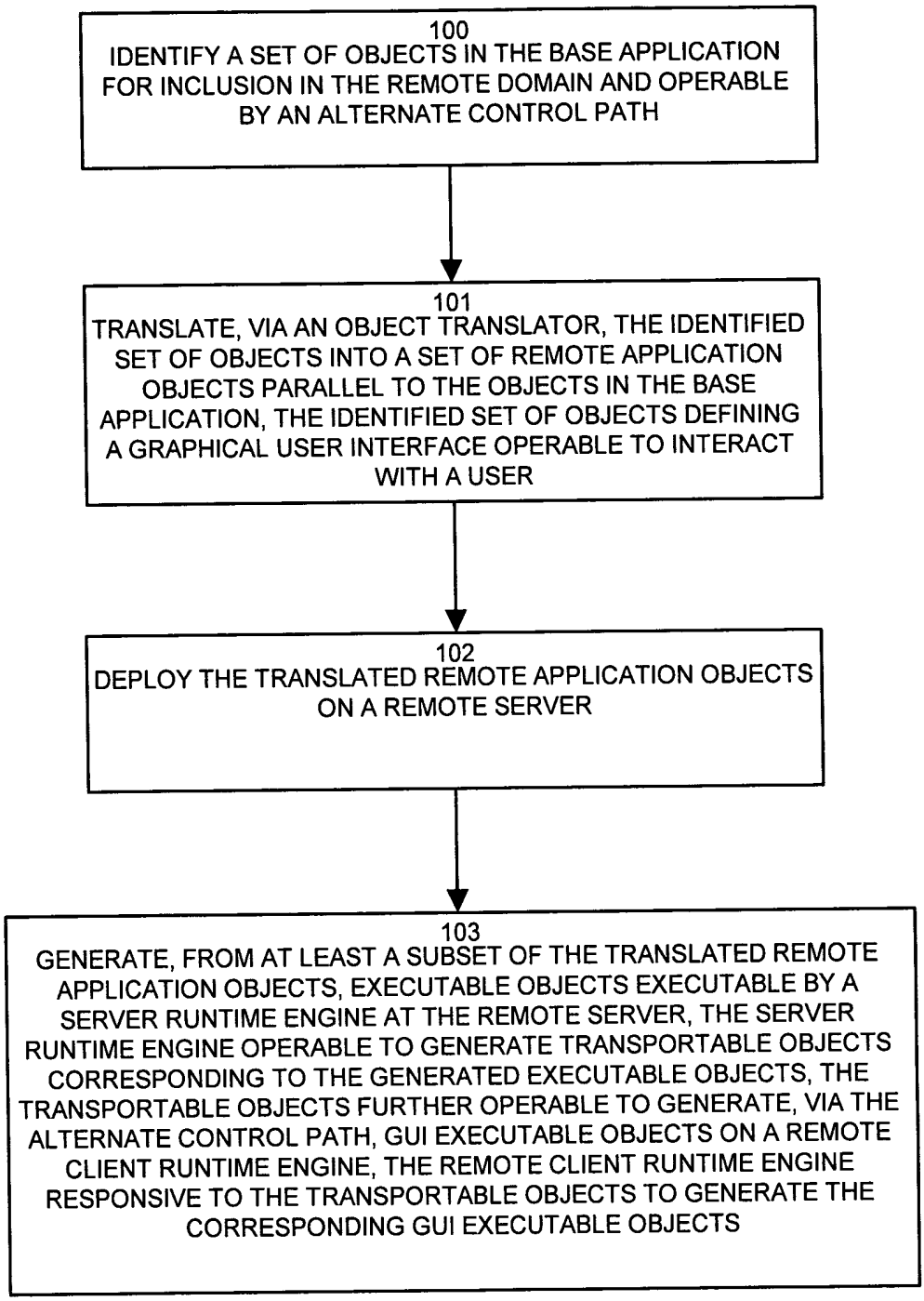
100
IDENTIFY A SET OF OBJECTS IN THE BASE APPLICATION FOR INCLUSION IN THE REMOTE DOMAIN AND OPERABLE BY AN ALTERNATE CONTROL PATH
101
TRANSLATE, VIA AN OBJECT TRANSLATOR, THE IDENTIFIED SET OF OBJECTS INTO A SET OF REMOTE APPLICATION OBJECTS PARALLEL TO THE OBJECTS IN THE BASE APPLICATION, THE IDENTIFIED SET OF OBJECTS DEFINING A GRAPHICAL USER INTERFACE OPERABLE TO INTERACT WITH A USER
102
DEPLOY THE TRANSLATED REMOTE APPLICATION OBJECTS ON A REMOTE SERVER
103
GENERATE, FROM AT LEAST A SUBSET OF THE TRANSLATED REMOTE APPLICATION OBJECTS, EXECUTABLE OBJECTS EXECUTABLE BY A SERVER RUNTIME ENGINE AT THE REMOTE SERVER, THE SERVER RUNTIME ENGINE OPERABLE TO GENERATE TRANSPORTABLE OBJECTS CORRESPONDING TO THE GENERATED EXECUTABLE OBJECTS, THE TRANSPORTABLE OBJECTS FURTHER OPERABLE TO GENERATE, VIA THE ALTERNATE CONTROL PATH, GUI EXECUTABLE OBJECTS ON A REMOTE CLIENT RUNTIME ENGINE, THE REMOTE CLIENT RUNTIME ENGINE RESPONSIVE TO THE TRANSPORTABLE OBJECTS TO GENERATE THE CORRESPONDING GUI EXECUTABLE OBJECTS

Fig. 2

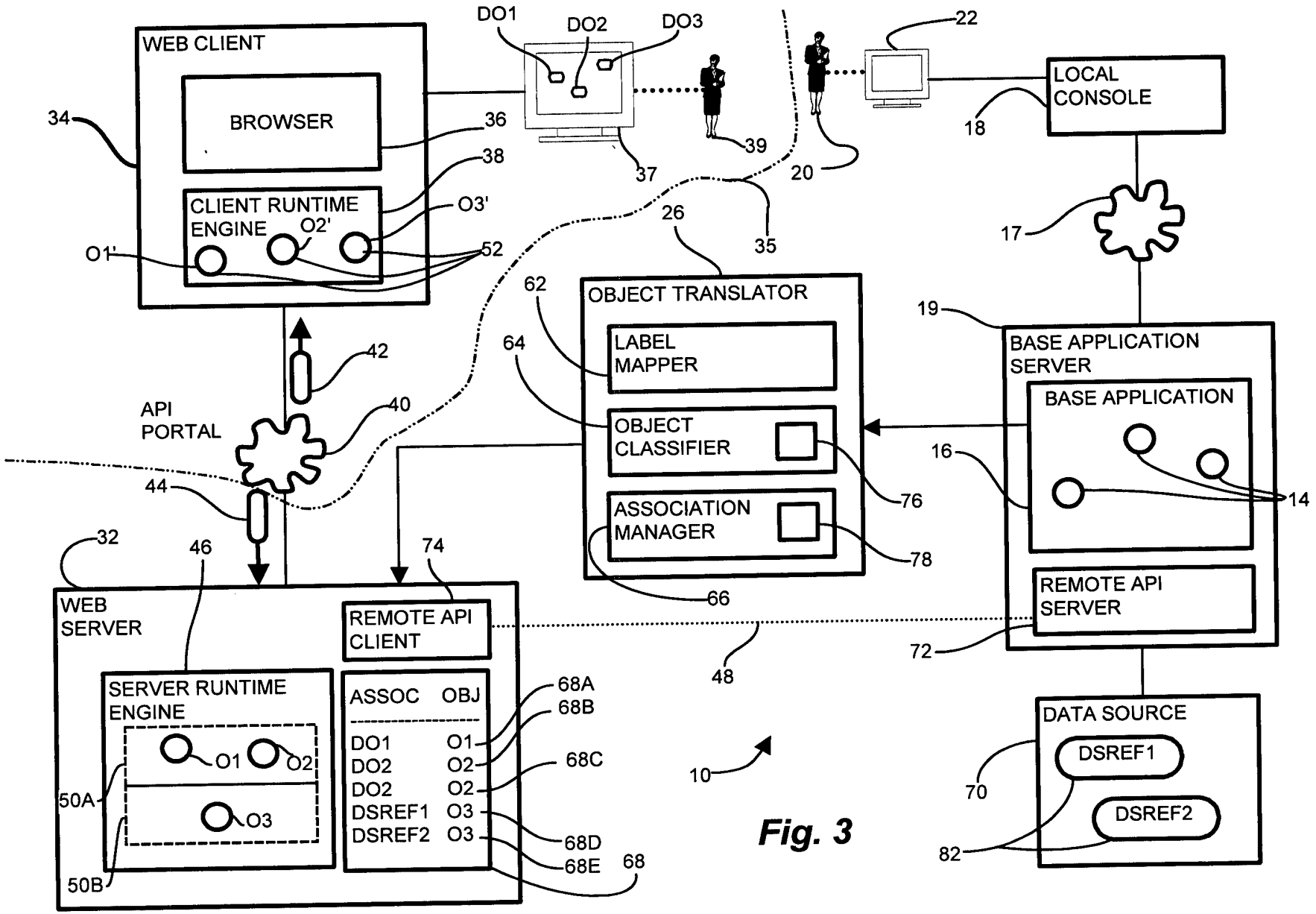
WEB CLIENT
BROWSER
CLIENT RUNTIME ENGINE
O1'
O2'
O3'
DO1
DO2
DO3
34
36
38
52
37
39
20
22
LOCAL CONSOLE
18
17
26
35
OBJECT TRANSLATOR
62
64
LABEL MAPPER
OBJECT CLASSIFIER
ASSOCIATION MANAGER
76
78
66
19
BASE APPLICATION SERVER
BASE APPLICATION
16
14
REMOTE API SERVER
72
42
40
API PORTAL
44
32
46
74
WEB SERVER
REMOTE API CLIENT
48
SERVER RUNTIME ENGINE
O1
O2
O3
50A
50B
ASSOC OBJ
DO1 O1
DO2 O2
DO2 O2
DSREF1 O3
DSREF2 O3
68A
68B
68C
68D
68E
68
10
DATA SOURCE
DSREF1
DSREF2
70
82

Fig. 3

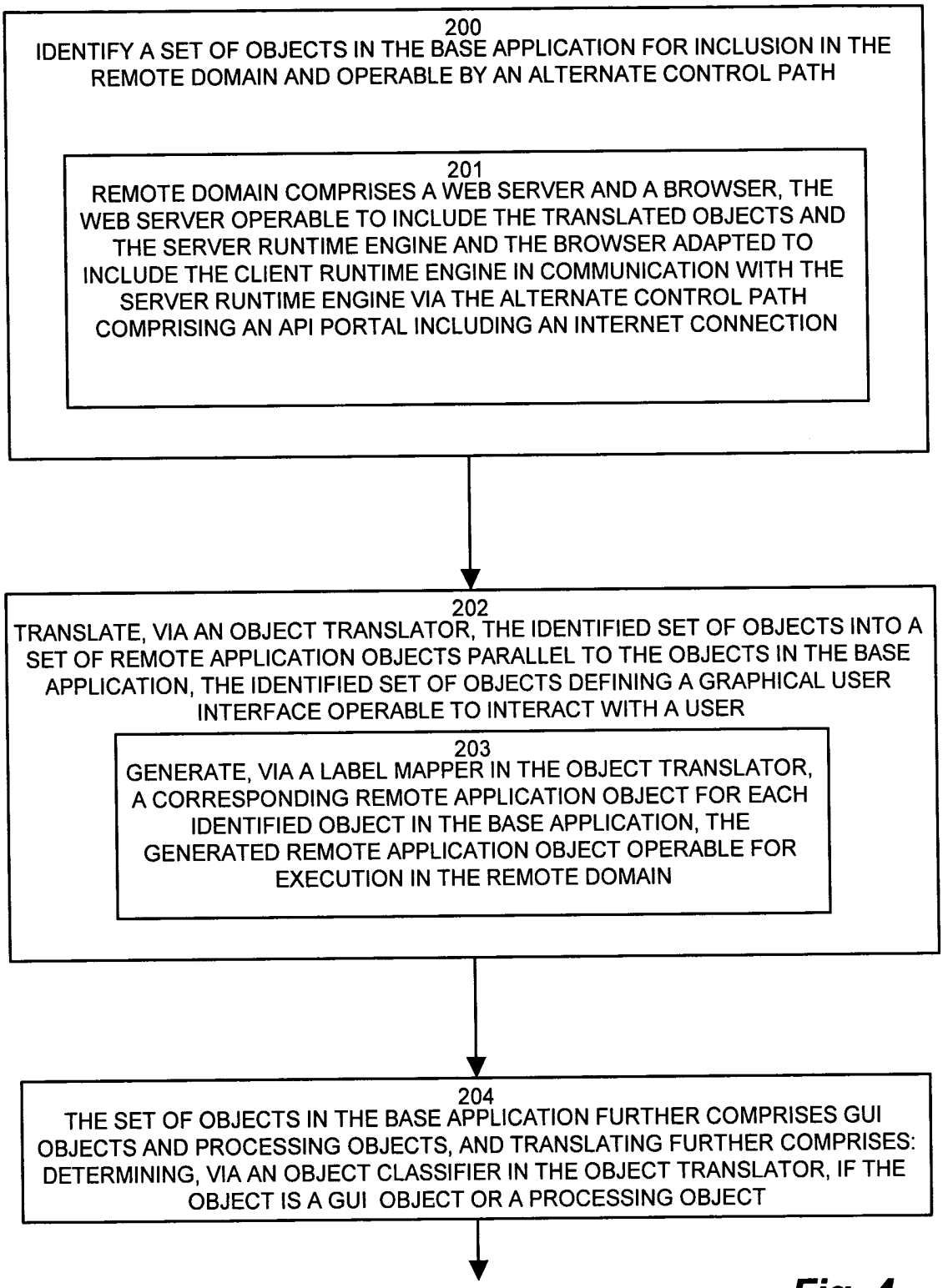
200
IDENTIFY A SET OF OBJECTS IN THE BASE APPLICATION FOR INCLUSION IN THE REMOTE DOMAIN AND OPERABLE BY AN ALTERNATE CONTROL PATH
201
REMOTE DOMAIN COMPRISES A WEB SERVER AND A BROWSER, THE WEB SERVER OPERABLE TO INCLUDE THE TRANSLATED OBJECTS AND THE SERVER RUNTIME ENGINE AND THE BROWSER ADAPTED TO INCLUDE THE CLIENT RUNTIME ENGINE IN COMMUNICATION WITH THE SERVER RUNTIME ENGINE VIA THE ALTERNATE CONTROL PATH COMPRISING AN API PORTAL INCLUDING AN INTERNET CONNECTION
202
TRANSLATE, VIA AN OBJECT TRANSLATOR, THE IDENTIFIED SET OF OBJECTS INTO A SET OF REMOTE APPLICATION OBJECTS PARALLEL TO THE OBJECTS IN THE BASE APPLICATION, THE IDENTIFIED SET OF OBJECTS DEFINING A GRAPHICAL USER INTERFACE OPERABLE TO INTERACT WITH A USER
203
GENERATE, VIA A LABEL MAPPER IN THE OBJECT TRANSLATOR, A CORRESPONDING REMOTE APPLICATION OBJECT FOR EACH IDENTIFIED OBJECT IN THE BASE APPLICATION, THE GENERATED REMOTE APPLICATION OBJECT OPERABLE FOR EXECUTION IN THE REMOTE DOMAIN
204
THE SET OF OBJECTS IN THE BASE APPLICATION FURTHER COMPRISES GUI OBJECTS AND PROCESSING OBJECTS, AND TRANSLATING FURTHER COMPRISES: DETERMINING, VIA AN OBJECT CLASSIFIER IN THE OBJECT TRANSLATOR, IF THE OBJECT IS A GUI OBJECT OR A PROCESSING OBJECT

Fig. 4

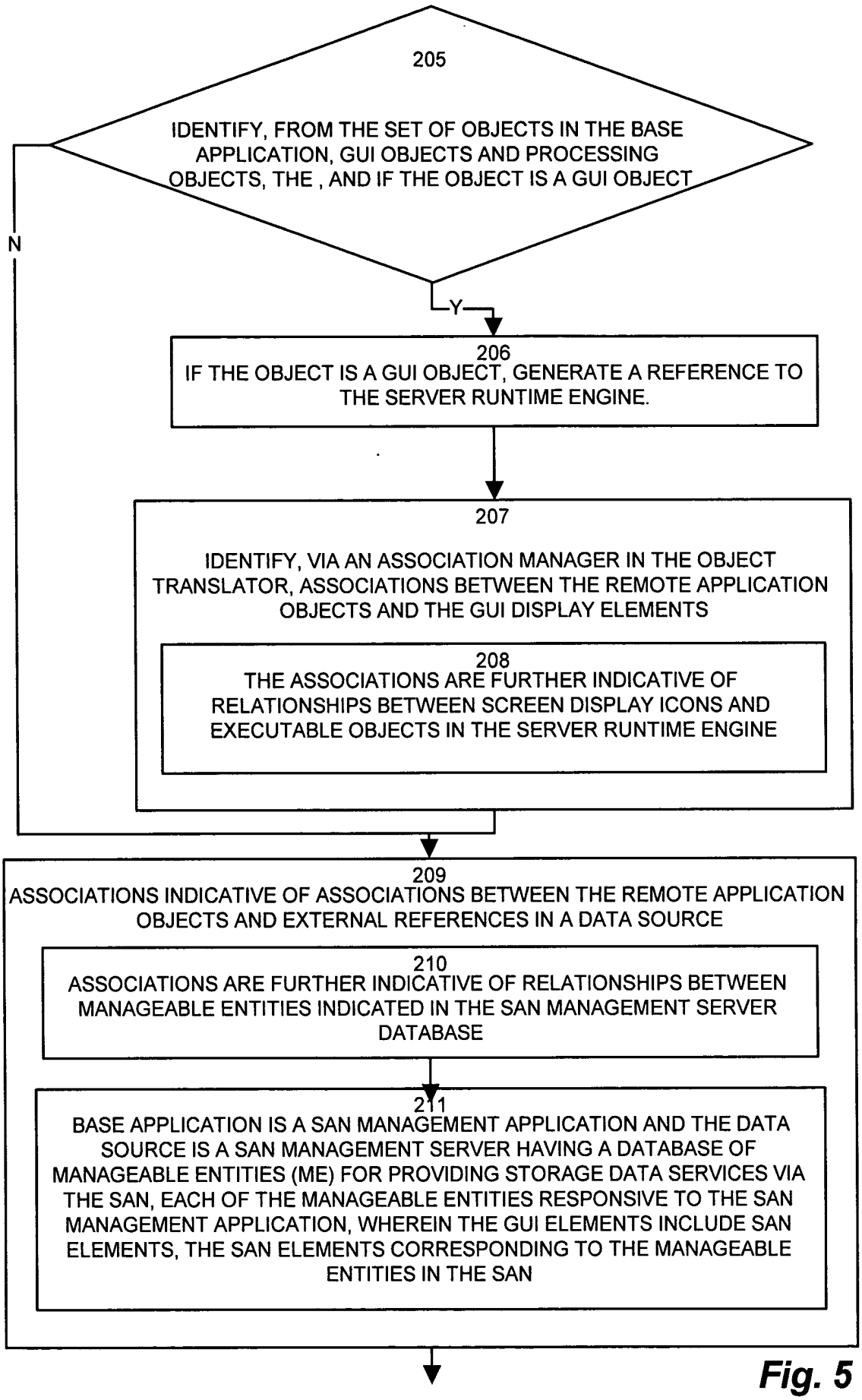
205
IDENTIFY, FROM THE SET OF OBJECTS IN THE BASE APPLICATION, GUI OBJECTS AND PROCESSING OBJECTS, THE , AND IF THE OBJECT IS A GUI OBJECT
N
Y
206
IF THE OBJECT IS A GUI OBJECT, GENERATE A REFERENCE TO THE SERVER RUNTIME ENGINE.
207
IDENTIFY, VIA AN ASSOCIATION MANAGER IN THE OBJECT TRANSLATOR, ASSOCIATIONS BETWEEN THE REMOTE APPLICATION OBJECTS AND THE GUI DISPLAY ELEMENTS
208
THE ASSOCIATIONS ARE FURTHER INDICATIVE OF RELATIONSHIPS BETWEEN SCREEN DISPLAY ICONS AND EXECUTABLE OBJECTS IN THE SERVER RUNTIME ENGINE
209
ASSOCIATIONS INDICATIVE OF ASSOCIATIONS BETWEEN THE REMOTE APPLICATION OBJECTS AND EXTERNAL REFERENCES IN A DATA SOURCE
210
ASSOCIATIONS ARE FURTHER INDICATIVE OF RELATIONSHIPS BETWEEN MANAGEABLE ENTITIES INDICATED IN THE SAN MANAGEMENT SERVER DATABASE
211
BASE APPLICATION IS A SAN MANAGEMENT APPLICATION AND THE DATA SOURCE IS A SAN MANAGEMENT SERVER HAVING A DATABASE OF MANAGEABLE ENTITIES (ME) FOR PROVIDING STORAGE DATA SERVICES VIA THE SAN, EACH OF THE MANAGEABLE ENTITIES RESPONSIVE TO THE SAN MANAGEMENT APPLICATION, WHEREIN THE GUI ELEMENTS INCLUDE SAN ELEMENTS, THE SAN ELEMENTS CORRESPONDING TO THE MANAGEABLE ENTITIES IN THE SAN

Fig. 5

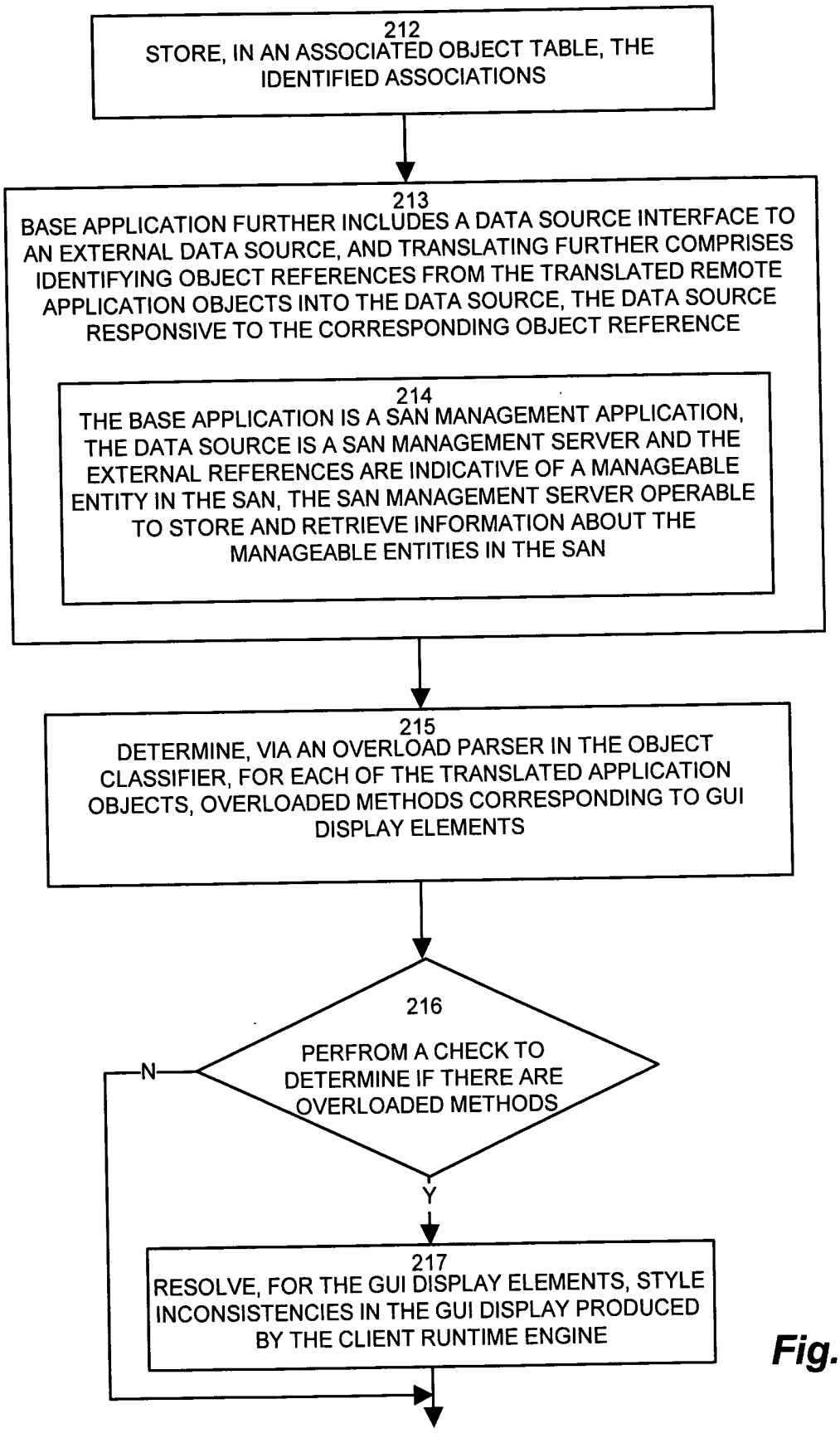
212
STORE, IN AN ASSOCIATED OBJECT TABLE, THE IDENTIFIED ASSOCIATIONS
213
BASE APPLICATION FURTHER INCLUDES A DATA SOURCE INTERFACE TO AN EXTERNAL DATA SOURCE, AND TRANSLATING FURTHER COMPRISES IDENTIFYING OBJECT REFERENCES FROM THE TRANSLATED REMOTE APPLICATION OBJECTS INTO THE DATA SOURCE, THE DATA SOURCE RESPONSIVE TO THE CORRESPONDING OBJECT REFERENCE
214
THE BASE APPLICATION IS A SAN MANAGEMENT APPLICATION, THE DATA SOURCE IS A SAN MANAGEMENT SERVER AND THE EXTERNAL REFERENCES ARE INDICATIVE OF A MANAGEABLE ENTITY IN THE SAN, THE SAN MANAGEMENT SERVER OPERABLE TO STORE AND RETRIEVE INFORMATION ABOUT THE MANAGEABLE ENTITIES IN THE SAN
215
DETERMINE, VIA AN OVERLOAD PARSER IN THE OBJECT CLASSIFIER, FOR EACH OF THE TRANSLATED APPLICATION OBJECTS, OVERLOADED METHODS CORRESPONDING TO GUI DISPLAY ELEMENTS
216
PERFROM A CHECK TO DETERMINE IF THERE ARE OVERLOADED METHODS
N
Y
217
RESOLVE, FOR THE GUI DISPLAY ELEMENTS, STYLE INCONSISTENCIES IN THE GUI DISPLAY PRODUCED BY THE CLIENT RUNTIME ENGINE

Fig. 6

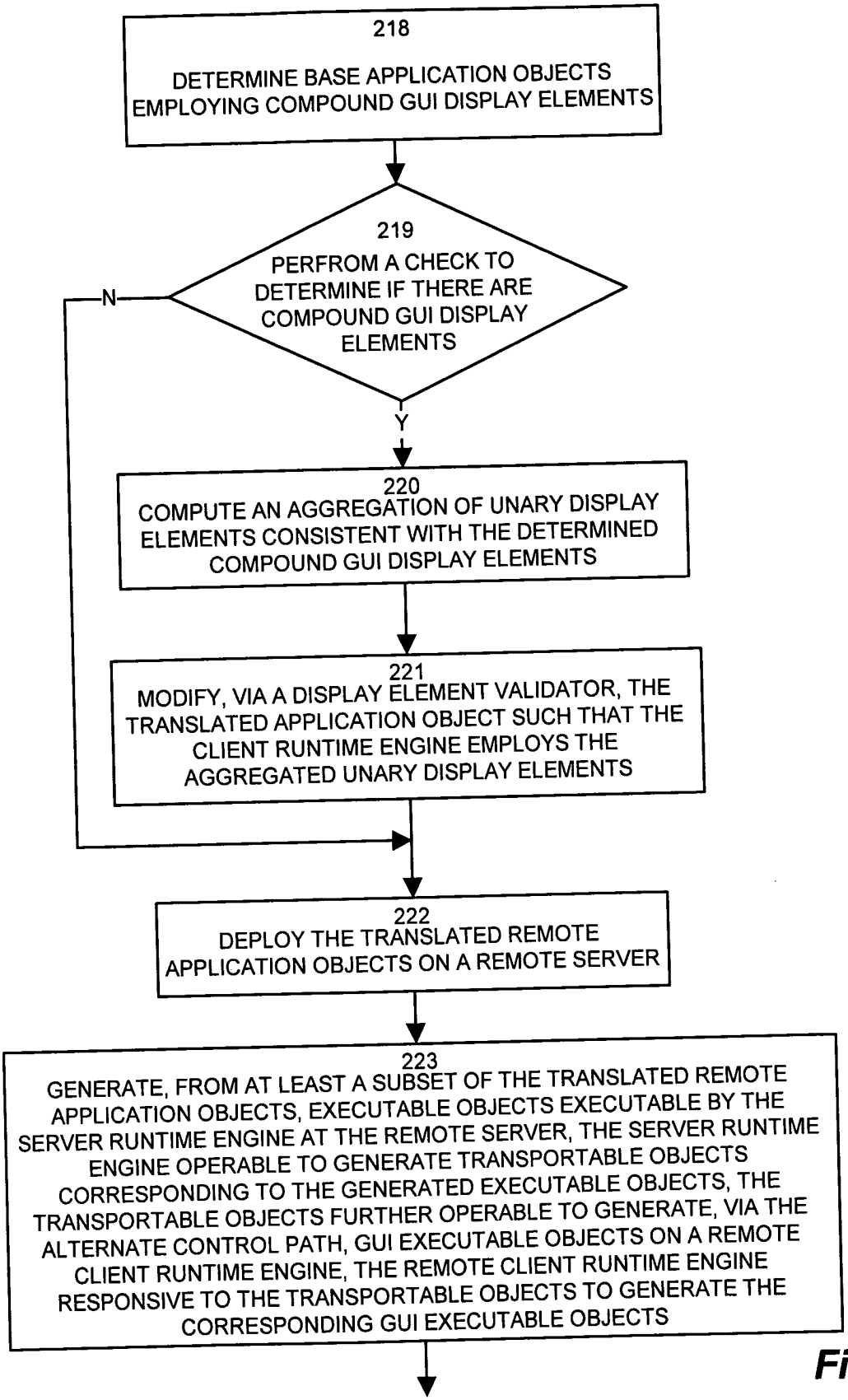
218
DETERMINE BASE APPLICATION OBJECTS EMPLOYING COMPOUND GUI DISPLAY ELEMENTS
219
PERFROM A CHECK TO DETERMINE IF THERE ARE COMPOUND GUI DISPLAY ELEMENTS
N
Y
220
COMPUTE AN AGGREGATION OF UNARY DISPLAY ELEMENTS CONSISTENT WITH THE DETERMINED COMPOUND GUI DISPLAY ELEMENTS
221
MODIFY, VIA A DISPLAY ELEMENT VALIDATOR, THE TRANSLATED APPLICATION OBJECT SUCH THAT THE CLIENT RUNTIME ENGINE EMPLOYS THE AGGREGATED UNARY DISPLAY ELEMENTS
222
DEPLOY THE TRANSLATED REMOTE APPLICATION OBJECTS ON A REMOTE SERVER
223
GENERATE, FROM AT LEAST A SUBSET OF THE TRANSLATED REMOTE APPLICATION OBJECTS, EXECUTABLE OBJECTS EXECUTABLE BY THE SERVER RUNTIME ENGINE AT THE REMOTE SERVER, THE SERVER RUNTIME ENGINE OPERABLE TO GENERATE TRANSPORTABLE OBJECTS CORRESPONDING TO THE GENERATED EXECUTABLE OBJECTS, THE TRANSPORTABLE OBJECTS FURTHER OPERABLE TO GENERATE, VIA THE ALTERNATE CONTROL PATH, GUI EXECUTABLE OBJECTS ON A REMOTE CLIENT RUNTIME ENGINE, THE REMOTE CLIENT RUNTIME ENGINE RESPONSIVE TO THE TRANSPORTABLE OBJECTS TO GENERATE THE CORRESPONDING GUI EXECUTABLE OBJECTS

Fig. 7

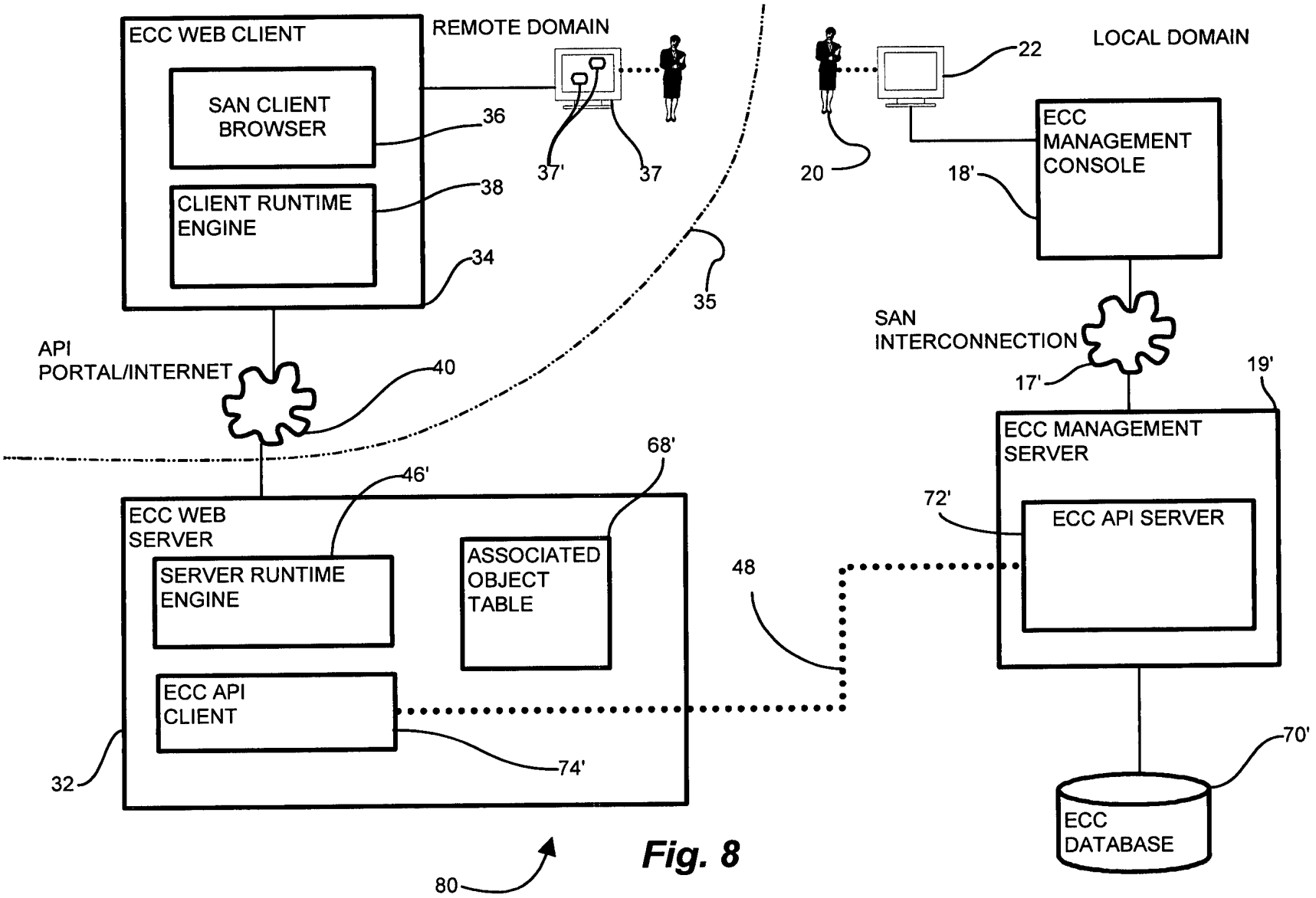
ECC WEB CLIENT
REMOTE DOMAIN
SAN CLIENT BROWSER
36
CLIENT RUNTIME ENGINE
38
34
37'
37
35
LOCAL DOMAIN
22
20
ECC MANAGEMENT CONSOLE
18'
SAN INTERCONNECTION
17'
19'
API PORTAL/INTERNET
40
ECC MANAGEMENT SERVER
68'
46'
72'
ECC API SERVER
ECC WEB SERVER
SERVER RUNTIME ENGINE
ASSOCIATED OBJECT TABLE
48
ECC API CLIENT
74'
32
70'
ECC DATABASE
80

Fig. 8